Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) An electro-larynx comprising:
   A. a waveform generator configured to selectively generate an input signal characterized by a frequency spectrum;
   B. a linear transducer having a throat engagement portion, said linear transducer configured to receive and transform said input signal into a corresponding output vibration of said throat engagement portion characterized by a frequency spectrum, said output vibration being a substantially linear function of said input signal whereby the frequency spectrum of said vibration matches said frequency spectrum of said input signal; and
   C. a power source.

2. (Original) An electro-larynx according to claim 1, wherein the linear transducer includes:
   a. an armature assembly, which receives said input signal and vibrates as a function thereof;
   b. a suspension assembly coupled to said armature assembly; and
   c. a coupler disk, as said engagement portion, coupled to said suspension assembly, wherein a vibration in said armature assembly causes a corresponding vibration of said coupler disk.

3. (Original) An electro-larynx according to claim 2 wherein the suspension assembly is a flexible planar membrane.

4. (Original) An electro-larynx according to claim 2 wherein the suspension assembly is a mechanical spring.

5. (Original) An electro-larynx according to claim 2 wherein the armature assembly is substantially disposed within a cylindrical motor assembly that defines an internal void

region along a central axis and having an radial magnetic field maintained within said internal void region, and wherein said armature assembly includes:

a. a bobbin coupled to said suspension assembly and disposed within said internal void region and along said central axis; and

b. a wire coil wrapped around said bobbin and within said magnetic field;

whereby when said input signal is applied to said wire coil a corresponding vibration of said bobbin is experienced.

6. (Original) An electro-larynx according to claim 2 wherein the armature assembly includes a piezo-electric actuator coupled to said engagement portion, wherein an input signal delivered to said piezo-electric actuator causes a corresponding linear vibration of said engagement portion.

7. (Original) An electro-larynx according to claim 2 wherein the armature assembly includes a magneto-resistive element coupled to said engagement portion, wherein an input signal delivered to said magneto-resistive element causes a corresponding linear vibration of said engagement portion.

8. (Original) An electro-larynx according to claim 1 wherein the linear transducer has a substantially flat frequency response over a range of about 20 to 2KHz.

9. (Original) An electro-larynx according to claim 1 wherein said input signal generated by said waveform generator has a harmonic structure corresponding to a normal glottal excitation, defined over multiple cycles.

10. (Original) An electro-larynx according to claim 1 wherein the waveform generator includes:

a. glottal sample data stored in an electronic memory;

b. a pitch adjuster, configured to add pitch information to said glottal sample data;

c. a multiplier, configured to add amplitude information to said glottal sample data;

d. an equalization filter for generating from said glottal sample data, pitch information, and amplitude information a base digital input signal having a predetermined frequency response; and

e. a digital to analog converter, configured to transform said base digital input signal into said input signal.

11. (Original) An electro-larynx according to claim 10 wherein the glottal sample data is obtained by inverse filtering and digitally sampling voice data.

12. (Currently amended) A linear transducer, for use in an electro-larynx having a waveform generator that produces an input signal and a power source, said linear transducer comprising:

A. an armature assembly, which receives said input signal characterized by a frequency spectrum and vibrates as a function thereof;

B. a suspension assembly coupled to said armature assembly; and

C. a coupler disk, coupled to said suspension assembly, wherein a vibration in said armature assembly causes a corresponding vibration of said coupler disk characterized by a frequency spectrum according to a linear function of said input signal, whereby the frequency spectrum of said vibration matches said frequency spectrum of said input signal.

13. (Original) A linear transducer according to claim 12 wherein the suspension assembly is a flexible planar membrane.

14. (Original) A linear transducer according to claim 12 wherein the suspension assembly is a mechanical spring.

15. (Original) A linear transducer according to claim 12 wherein the armature assembly is substantially disposed within a cylindrical motor assembly that defines an internal void region along a central axis and having a magnetic field maintained with said internal void region, and wherein said armature assembly includes:

a. a bobbin coupled to said suspension assembly and disposed within said internal void region and along said central axis; and

b. a wire coil wrapped around said bobbin and within said magnetic field;

whereby when said input signal is applied to said wire coil a corresponding vibration of said bobbin is experienced.

16. (Original) A linear transducer according to claim 12 wherein the armature assembly includes a piezo-electric actuator coupled to said coupler disk, wherein an input signal delivered to said piezo-electric actuator causes a corresponding linear vibration of said coupler disk.

17. (Original) A linear transducer according to claim 12 wherein the armature assembly includes a magneto-resistive element coupled to said coupler disk, wherein an input signal delivered to said magneto-resistive element causes a corresponding linear vibration of said coupler disk.

18. (Original) A linear transducer according to claim 12 wherein the linear transducer has a substantially flat frequency response over a range of about 20 to 2KHz.

19. (Currently amended) An electro-larynx comprising:

a waveform generator comprising:

A. glottal sample data stored in an electronic memory, wherein said glottal sample data is defined over multiple cycles;

B. a pitch adjuster, configured to add pitch information to said glottal sample data;

C. a mixer, configured to add amplitude information to said glottal sample data;

D. an equalization filter for generating from said glottal sample data, pitch information, and amplitude information, a base digital input signal having a predetermined frequency response; and

E. a digital to analog converter, configured to transform said base digital input signal into an input signal, characterized by a frequency spectrum;

a linear transducer configured to receive and transform said input signal into a corresponding output vibration of a throat engagement portion characterized by a frequency spectrum, said output vibration being a substantially linear function of

said input signal whereby the frequency spectrum of said vibration matches said frequency spectrum of said input signal.

20. (Original) A waveform generator according to claim 19 wherein the glottal sample data is obtained by inverse filtering and digitally sampling voice data.

21. (Original) A waveform generator according to claim 19 wherein the glottal sample data is derived from a mathematical model which preserves the harmonic qualities of the voice data.

22. (Currently Amended) An electro-larynx comprising:

A. a waveform generator configured to selectively generate an input signal characterized by a frequency spectrum, wherein said input signal has a harmonic structure corresponding to a normal glottal excitation, defined over multiple cycles;

B. a linear transducer having a throat engagement portion, said transducer configured to receive and transform said input signal into a corresponding output vibration of said throat engagement portion characterized by a frequency spectrum said output vibration being a substantially linear function of said input signal whereby the frequency spectrum of said vibration matches said frequency spectrum of said input signal; and

C. a power source.

23. (Original) An electro-larynx according to claim 22 wherein the waveform generator includes:

a. glottal sample data stored in an electronic memory;

b. a pitch adjuster, configured to add pitch information to said glottal sample data;

c. a multiplier, configured to add amplitude information to said glottal sample data;

d. an equalization filter for generating from said glottal sample data, pitch information, and amplitude information a base digital input signal having a predetermined frequency response; and

e. a digital to analog converter, configured to transform said base digital input signal into said input signal.

24. (Original) An electro-larynx according to claim 23 wherein the glottal sample data is obtained by inverse filtering and digitally sampling voice data.

25. (Original) An electro-larynx according to claim 23 wherein the glottal sample data is derived from a mathematical model which preserves the harmonic qualities of the voice data.